



#19 | Response
P. Evans
8-19-02

**RESPONSE AFTER FINAL
EXPEDITED PROCEDURE
EXAMINING GROUP 2834
PATENT APPLICATION**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

~~PYRHÖNEN~~

Art Unit: 2834

~~Application No.: 09/269,754~~

Examiner: T. Lam

~~Filed: April 7, 1999~~

Attorney Dkt. No.: 108306-09004

~~For: AN ELECTRIC MACHINE CONSTRUCTION AND METHOD FOR AN
ELECTRIC MACHINE~~

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RESPONSE UNDER 37 C.F.R. § 1.116

BOX AF

Commissioner for Patents
Washington, D.C. 20231

Date: August 9, 2002

Sir:

In reply to the outstanding Office Action dated April 9, 2002, the time for reply having been duly extended from July 9, 2002, until August 9, 2002, by the attached Petition for Extension of Time, please enter the following remarks.

REMARKS

The Office Action dated April 9, 2002, has been received and carefully noted. The following remarks are submitted as a full and complete response thereto. Claims 1-12 are pending in the application and submitted for reconsideration.

Claims 1-6 and 8-11 were rejected under 35 USC § 103(a) as being unpatentable over two cited references, Japanese patent no. JP35206204A to Ozaki in

view of Japanese patent no. JP404138056A to Sato. In particular, it was asserted in the Office Action that Ozaki discloses all the claimed features of the present invention except the inlet opening position intermediate of the rotor ends. The Examiner asserted that Sato shows in its figs. 1 and 4, an inlet opening positioned intermediate of the stator for the purpose of evenly distributing inlet air in the stator space. Therefore, it was asserted in the Office Action that it would have been obvious to combine the references to derive the invention as defined by claim 1-6 and 8-11. The Applicants respectfully traverse the rejection and submit that claims 1-6 and 8-11 recite subject matter not shown or suggested by the cited prior art.

Claim 1 defines an electric machine construction, which includes a stator space, a stator and a rotor. The stator space is defined by a shell and end portions at both ends of the shell. The stator and rotor have a first end and a second end disposed within the stator space, which include at least one cooling medium inlet opening and a suction means. The cooling medium inlet opening(s) are in the shell and positioned intermediate the ends of the rotor. The suction means is in the vicinity of both end portions of the stator space for providing suction for drawing cooling medium into the stator space. The suction means are fans arranged at an interior side of the end portions of the stator space including rotor bearings, in which an outlet channel of the fans extends through the end portions. The arrangement is such that the cooling medium is drawn by the suction into the stator space through the inlet opening(s) and that the cooling medium is removed at the vicinity of both portions of the stator space.

Claim 8 recites a method for an electric construction. The electric construction includes a stator space defined by a shell and end portions at the either ends of the

shell, wherein a stator and a rotor of the electric machine are disposed within the stator space. The cooling medium is drawn into the stator space through at least one cooling medium inlet opening in the shell intermediate the ends of the rotor by suction means for providing a suction. The suction means is provided at a vicinity of both end portions and are fans arranged at an interior side of the end portions of the stator space including rotor bearings, in which an outlet channel of the fans extends through the end portions. The cooling medium is removed at the vicinity of both ends portions of the stator space.

Ozaki merely shows a counter flow barrier for circulating airflow within the stator space of an electric machine. Ozaki shows inlets in the ends of its machine, presumably for receiving forced air. Reference number 5 in figs. 1 and 2 does not appear to be a fan, but instead appears to be part of the counter flow barrier described in the abstract. The Applicant submits that the machine of Ozaki is a regular radial flux machine, in which the cooling of the winding ends has been boosted with the fans shown in the figures. Ozaki is merely aimed to the counter flow barrier for circulating airflow within the stator space, which circulates air out of the end 1 via a passage 7. Ozaki fails to show or suggest the suction means as defined by claims 1 and 8. Furthermore, Ozaki does not describe or suggest any inlet in the machine shell intermediate of its ends.

Sato does not make up for the deficiencies of Ozaki. The Sato machine is of an entirely different design, an axial flux machine. The Sato machine has two permanent magnet rotors arranged with both sides of one stator. This design makes the machine entirely different with respect to cooling. Figs. 4 and 5 of Sato, which do not include the

shell, only show internal air flow in and around the stator and rotor. Sato does not show any inlets in its machine shell intermediate of its ends. Sato clearly describes that coolant is injected via a hollow rotor shaft. Even assuming *arguendo* that the arrows could be interpreted to suggest such inlets, there would have been no motivation to add such inlets to the device of Ozaki, which already circulates its air flow a particular way out the ends of its device. It is not even clear where such inlets could be added to the shell of the device in Ozaki and if such inlets were added, if they would defeat the invention of Ozaki. Thus, the Applicant submits that the combination of the references does not show or suggest each and every element of the claimed invention. Furthermore, even if the references could be combined there is inadequate motivation to combine the references to derive the claimed invention. Accordingly, Applicants request that the rejection be withdrawn and that claims 1, and 2-5 which depend thereon, 8, and 9-11 which depend thereon, be allowed.

Claims 7 and 12 were rejected under 35 USC § 103(a) as being unpatentable over Ozaki in view of Sato, further in view of Sheerin (U.S. Patent No. 5,844,333). Applicants respectfully traverse the rejection and submit that claims 7 and 12 recite subject matter which is not shown or suggested by any combination of the cited prior art.

Sheerin discloses a device and method for cooling a motor. A motor 100 is disposed in an enclosed motor frame 20. Sheerin discloses an ambient air fan 44 with a motor drive shaft 58. Disposed within enclosure 96 is a first air-to-air heat exchanger 24 having a plurality of coolant tubes 28. A first heat exchange 24 is disposed above a first end of motor 100 with coolant tubes 28 extending substantially transverse to the

longitudinal axis of drive shaft 58. Also disposed within enclosure 96 is a second air-to-air heat exchanger 26 having a plurality of coolant tubes 34. The second heat exchanger 26 is disposed above a second, opposed end of motor 100 with coolant tubes 34 extending substantially transversed to the longitudinal axis of drive shaft 58. The Sheerin patent presents a conventional structure.

Accordingly, Sheerin fails to make up for the above-described deficiencies of Ozaki and Sato. Thus, since claims 7 and 12 depend upon claims 1 and 8, respectively, Applicants submit that the combination of cited prior art fails to show or suggest each and every element of claims 7 and 12. Accordingly, Applicants request that the rejection be withdrawn and claims 7 and 12 be allowed.

In view of the above, Applicant respectfully submits that claims 1-12, each recites subject matter that is neither disclosed nor suggested in the cited prior art. Applicant also submits that this subject matter is more than sufficient to render the claims non-obvious to a person of ordinary skill in the art, and therefore respectfully requests that claims 1-12 be found allowable and that this application be passed to issue.

In the event this paper is not being filed, Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees, may be charged to Counsel's Deposit Account No. 01-2300.

Respectfully submitted,
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